

ABSTRACT OF THE DISCLOSURE

Shape-persistent organic materials, including polymers, with large degrees of interior free volume are described, along with behaviors and phenomena enabled by their unique properties. One class of such a material is built up from triptycene base moieties 5 wherein three benzene rings are bridged together about a [2.2.2] tricyclic ring system. These units can be assembled into discreet molecules and polymers. These materials and/or formulations thereof with liquid crystals or polymers are useful for the complexation of chemicals and/or polymers; they have very low dielectric constants for use as coatings in dielectric circuits, they provide additional ordering mechanisms in liquid 10 crystals, and they display unusual mechanical responses when subjected to electrochemical, chemical, or mechanical stimuli.